EXHIBIT H

EXHIBIT 4

Entropic Communications, LLC v. Cox Communications, Inc., et al.
Case 2:23-cv-01049-JWH-KES (C.D. Cal.)

U.S. Patent No. 8,284,690 (the "'690 Patent") Exemplary Infringement Chart

Cox operates and maintains a nationwide television and data network through which it sells, leases, and offers for sale products and services, including the Technicolor CGM4981, Technicolor CGM4331, Technicolor CGM4141, Technicolor CVA4004, ARRIS / Surfboard TM3402, ARRIS / Surfboard G36, ARRIS / Surfboard G54, ARRIS / Surfboard S33, ARRIS / Surfboard CM8200, ARRIS / Surfboard G34, ARRIS / Surfboard SB8200, ARRIS / Surfboard DG2460, ARRIS TM9202, Hitron CODA56, Hitron CODA, Humax HGD310, Motorola B12, Motorola MB8611, Motorola MG8725, Motorola MB8600, Motorola MG8702, Netgear CM2000, Netgear C7800, Netgear CAX30, Netgear CAX80, Netgear CBR750, Netgear CM1000, Netgear CM1000v2, Netgear CM1100, Netgear CM1200, Netgear CM2500, Netgear CM3000, Ubiquiti UCI, ARRIS / Surfboard TG2472, ARRIS / Surfboard SBG7400AC2, ARRIS / Surfboard SBG7600AC2, Motorola MB7621, Motorola MG7700, Netgear C6900, Netgear C7000v2, Netgear C7500, Netgear CBR40, Netgear CM600, Netgear CM700, TP-LINK TC-7650, ARRIS / Surfboard SB6183, ARRIS / Surfboard SBG6900, Asus CM16, Motorola MB7420, Motorola MG7540, Motorola MG7550, Netgear C6230, Netgear C6250, Netgear C6300, Netgear C6300v2, Netgear CM500, TP-LINK TC-7620, TP-LINK CR500, TP-LINK CR700, TP-LINK CR1900, SMC D3CM1604, Zoom 5370, and products that operate in a similar manner ("Accused Cable Modem Products"), as well as the Arris AX013ANC STB, Arris AX013ANM STB, Pace PX022ANC STB, Pace PX022ANM STB, Samsung SX022ANC STB, Samsung SX022ANM STB, and products that operate in a similar manner ("Accused Set Top Products"). Cox provides cable television and internet services ("Accused Services") via the lease, sale, and/or distribution of the Accused Cable Modem Products and/or the Accused Set Top Products. Cox literally and/or under the doctrine of equivalents infringes the claims of the '690 Patent by making, using, selling, offering for sale, and/or importing the Accused Services, Accused Cable Modem Products, and/or the Accused Set Top Products.

As shown below in the chart with exemplary support, the Accused Services infringe at least claims 7 and 8 of U.S. Patent No. 8,284,690 ("'690 Patent"). The '690 Patent was filed December 10, 2009, issued October 9, 2012, and is entitled "Receiver Determined Probe." The '690 Patent claims priority to U.S. Provisional Patent Application No. 61/122,687, filed on December 15, 2008, and to U.S. Provisional Patent Application No. 61/179,454, filed on May 19, 2009.

Cox infringes at least claims 7 and 8 through its use of Active Probes in the provision of the Accused Services in connection with DOCSIS 3.1 Cable Modems. The Arris CM8200 cable modem, Technicolor CGM4141 cable modem, and Technicolor CGM4331 cable modem are DOCSIS 3.1 cable modems and are representative of the relevant DOCSIS 3.1 Cable Modems ("Accused D3.1 Cable

Modem Products"). The Accused D3.1 Cable Modem Products infringe the claims of the '690 Patent, as described below, either directly under 35 U.S.C. § 271(a), or indirectly under 35 U.S.C. §§ 271(b)–(c).

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1pre	A method comprising:	The Accused Services perform the claimed method utilizing, for example, including a Cable Modem Termination System ("CMTS") and/or Converged Cable Access Platform ("CCAP") operated by Cox and at least one Accused D3.1 Cable Modem Product located at each subscriber location, including, for example, the Technicolor CGM4981, Technicolor CGM4331, Technicolor CGM4141, Technicolor CVA4004, ARRIS / Surfboard TM3402, ARRIS / Surfboard G36, ARRIS / Surfboard G54, ARRIS / Surfboard S33, ARRIS / Surfboard CM8200, ARRIS / Surfboard G34, ARRIS / Surfboard SB8200, ARRIS / Surfboard DG2460, ARRIS TM9202, Hitron CODA56, Hitron CODA, Humax HGD310, Motorola B12, Motorola MB8611, Motorola MG8725, Motorola MB8600, Motorola MG8702, Netgear CM2000, Netgear C7800, Netgear CAX30, Netgear CAX80, Netgear CBR750, Netgear CM1000, Netgear CM1000v2, Netgear CM1100, Netgear CM1200, Netgear CM2500, Netgear CM3000, Ubiquiti UCI, and products that operate in a similar manner. By way of example, the Technicolor CGM4141 cable modem is charted herein. On information and belief, the Accused D3.1 Cable Modem Products include the same chipsets and have identical or substantially identical operation, such that they all infringe the '690 patent in the same manner as charted More specifically, Cox utilizes Modulation Error Ratio (MER) data in the operation of its network, such as in the operation of its PMA system. *See, e.g.*, ENTROPIC_COX_002942 at ENTROPIC_COX_002943. Additionally and on informed belief, MER data is utilized in the operation of Cox's network in the pre-equalization of upstream OFDMA channels. As described in more detail below, this data is generated using probes are requested by a CMTS and generated and transmitted by the CMs. On informed belief, Cox utilizes information from the pre-equalization of OFDMA channels in the operation of its network, including performing preventative network maintenance ("PNM") and optimizing the

#	U.S. Patent No. 8,284,690	Accused Products and Services
		operation of its cable plant. *See, e.g.*, ENTROPIC_COX_002919 at ENTROPIC_COX_002929, ENTROPIC_COX_002932-3. Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.
1a	a) receiving in a first node, a probe request specifying a first plurality of parameters associated with the generation and transmission of a probe, wherein the first plurality of parameters at least specify content payload of the probe and a second node;	The Accused Services include receiving in a first node, a probe request specifying a first plurality of parameters associated with the generation and transmission of a probe, wherein the first plurality of parameters at least specify content payload of the probe and a second node as described below. Specifically, the Technicolor CGM4141, using circuitry and/or applicable software modules located in the Technicolor CGM4141, samples and digitizes the entire 1GHz downstream spectrum of a cable plant and includes remote diagnostics capabilities that provide real time, unobtrusive diagnostic and spectrum analysis capabilities. These remote diagnostic capabilities include measuring statistics of the downstream spectrum. The Technicolor CGM4141 provides an agent that receives requests querying the performance of the downstream spectrum from a second node. For example, in a deployed system, the first node may be a cable modem and the second node may be a CMTS and/or CCAP. On informed belief, the CMTS and/or CCAP operated by Cox generate MER data in conjunction with the Accused D3.1 Cable Modem Products. For example, the Technicolor CGM4141 receives MAP messages (i.e. Version 5 MAP Messages for Probe Frames (P-MAPs)) indicating a request for a probe. The type of the probe is specified in the P-MAP, including a plurality of parameters indicating if the requested probe is a RxMER probe,

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		transmit power, pre-equalization, symbol patterns, symbol padding, and the like. The P-MAP further specified a source address, which identifies a second node. "The parameters of probe frame MAP messages transmitted by a CMTS MUST include: Upstream Channel ID: This 8-bit field is the identifier of the upstream channel to which this message refers. UCD Count: Matches the value of the Configuration Change Count of the UCD which describes the burst parameters which apply to this map. See Section 11.1. Number of Elements: This 9-bit field is the number of information elements in the P-MAP. The maximum value for this field is 128 for P-MAPs. Reserved: Reserved field for 32-bit boundary alignment. This field is a 3-bit field in version 5 P-MAPs. Channel Allocation Type (CAT): Set to 1 in all P-MAPs to designate this MAP as describing probe transmit opportunities. This field is 4 bits. Alloc Start Time: Effective start time from CMTS initialization (in minislots) for assignments within this map. This is the first minislot of the first probe frame described in the P-MAP. Probe Information Elements (P-IE): Describe the specific usage of symbols within a probe frame as detailed below. The CMTS MUST comply with Figure 40 and Table 33 for Probe Information Elements." (ENTROPIC_COX_002020 at ENTROPIC_COX_002145)

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		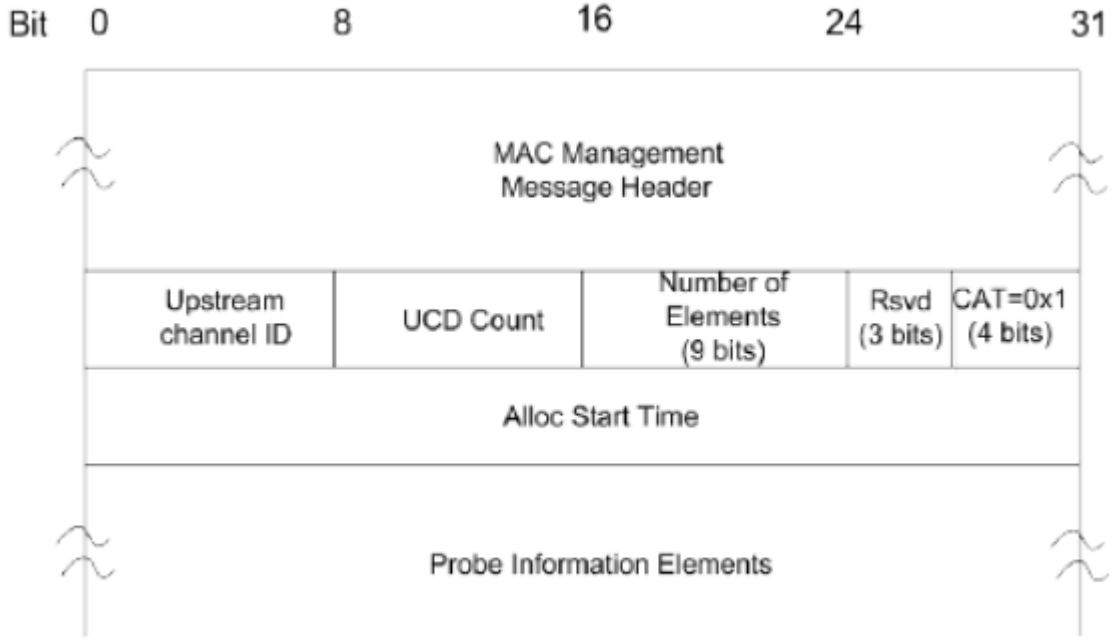 ***Figure 39 - Version 5 MAP Format for probe frames (P-MAPs)*** (ENTROPIC_COX_002020 at ENTROPIC_COX_002145)

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		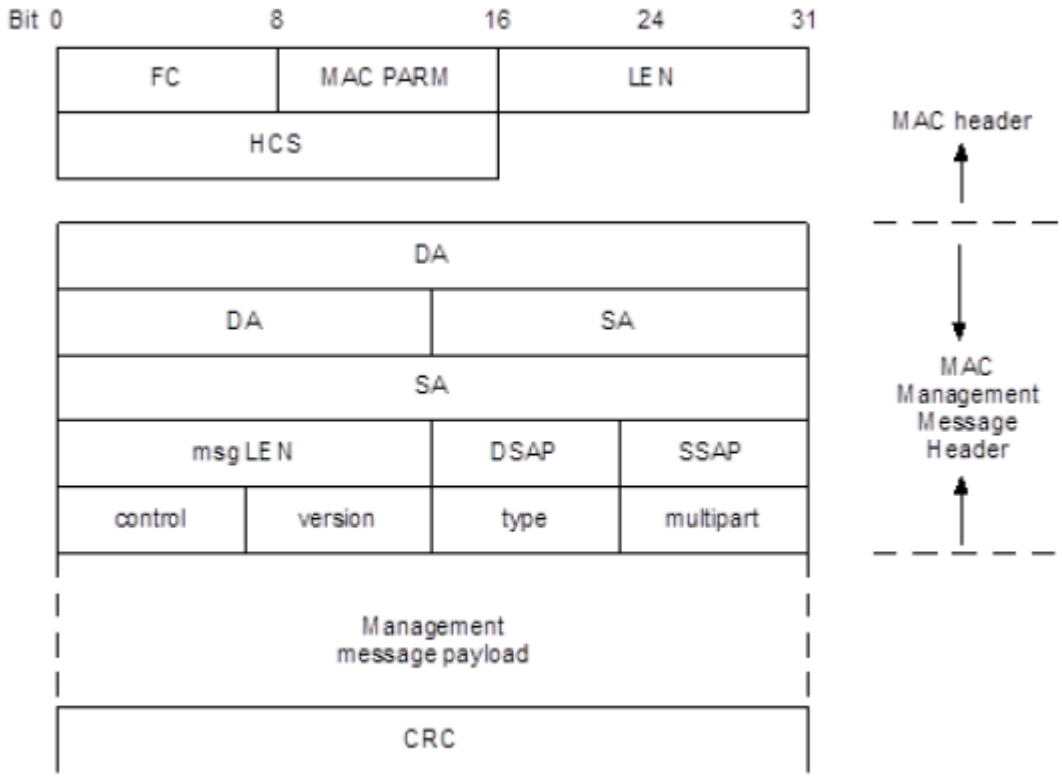 ***Figure 29 - MAC Header and MAC Management Message Header Fields*** (ENTROPIC_COX_002020 at ENTROPIC_COX_002118)

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Table 33 - Probe Information Element Definition

Field	Length	Definition
SID	14 bits	Ranging SID for CM assigned to use this probe
MER	1 bit	CMTS RxMER Measurement Control (ignored by CM) 0= do not measure RxMER at the CMTS on this probe 1= measure RxMER at the CMTS on this probe
PW (Power)	1 bit	Power Control for Probe This value is used to define the transmission power per subcarrier when the CMTS is using Maximum Scheduled Minislots (MSM) to accommodate a need to increase the PSD for the channel for a given CM. (See the Maximum Scheduled Minislots section in [DOCSIS PHYv3.1]). 0= transmit using normal power settings. This will be the normal setting for MSM CMs transmitting with a staggered/skip pattern consistent with the MSM settings. This is also the setting for probes on FDX channels. (See Note) 1= transmit using alternate power setting specified by the Start Subc field. The CMTS will use this setting when it assigns to an MSM CM a probe that allocates more subcarriers than appropriate for the MSM setting. (The MSM setting is transparent to the CM.)
EQ (Tx Equalization)	1 bit	Transmit Equalization for Probe 0= equalizer enabled 1= equalizer disabled
St (Stagger)	1 bit	If this bit is 1, repeat the pattern in this P-IE in the next number of symbols equal in quantity to "Subc skip" (see below) and by moving the pattern up by one subcarrier in each symbol and wrapping the pattern back to the beginning. If this value is zero, no stagger is to be used. (See Note)
Probe Frame	2 bits	Number of frames offset from the frame beginning at the allocation start time of this MAP; this indicates the first frame for which this P-IE is applicable. A value of zero indicates the first probe frame of the MAP.
Symbol in Frame	6 bits	Number of symbols offset from the beginning of the probe frame specified in the Probe Frame Field. A value of zero indicates the first symbol of the probe frame. Valid values are 0 to K-1 where K is the number of symbols in a frame.
Start Subc	3 bits	Starting Subcarrier – this value represents the starting subcarrier to be used by the probe. A value of zero indicates the first subcarrier in the symbol. Start Subc must be less than or equal to the Subc Skip value when PW=0. When the PW bit is one, this value represents not only the starting subcarrier, but also represents the change that should be made in the transmitted power for the probe transmission. Start Subc may be greater than the Subc Skip value when PW=1. The starting subcarrier when PW=1 is Start Subc modulo [Subc Skip + 1]. For PW=1, the following powers per subcarrier are required to be used for the probe transmission: Start Subc=0, power per subcarrier reduced by 2 dB, Start Subc=1, power per subcarrier reduced by 3 dB, Start Subc=2, power per subcarrier reduced by 4 dB, Start Subc=3, power per subcarrier reduced by 5 dB, Start Subc=4, power per subcarrier reduced by 6 dB, Start Subc=5, power per subcarrier reduced by 7 dB, Start Subc=6, power per subcarrier reduced by 8 dB, Start Subc=7, power per subcarrier reduced by 9 dB. See the requirement following the table.
Subc Skip/ECT	3 bits	If St bit =1, this field represents the Subcarrier Skipping to be used. If St=0 and PW=0, this field represents the ECT Control. Subcarrier Skipping is the number of subcarriers to be skipped between successive pilots in the probe. A value of zero implies no skipping of subcarriers and that all non-excluded subcarriers are used for probing. For staggered patterns, Subc Skip performs an additional function. (Subc Skip + 1) is the total number of symbols for which the staggered P-IE allocation applies. ECT control is used on FDX channels and defines whether a probe is used for ECT purposes (ECT Probe) or is to be used for ranging purposes (probe or non-ECT probe). 0= probe used for ranging purposes 1=probe used for Echo Cancellation Training (ECT probe) 2:7=reserved for future use

(ENTROPIC_COX_002020 at ENTROPIC_COX_002146)

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		Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.
1b	b) determining a second plurality of parameters associated with generation and transmission of the probe;	The Accused D3.1 Cable Modem Products determine a second plurality of parameters associated with generation and transmission of the probe as described below. Specifically, the Technicolor CGM4141 determines information responsive to the received request based on the measured statistics of the downstream spectrum. Upon information and belief, the information includes a second plurality of parameters associated with the generation and transmission of the probe. For example, a second plurality of parameters associated with the generation and transmission of the probe can be determined, such as the particular symbols used in the probe, the specific subcarriers over which the probe is transmitted, and/or the power level used for transmitting the probe. *See also* the example described in ENTROPIC_COX_002020 at ENTROPIC_COX_002147-9. Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.
1c	c) generating the probe in accordance with the first plurality of parameters and the second plurality of parameters,	The Accused D3.1 Cable Modem Products generate the probe in accordance with the first plurality of parameters and the second plurality of parameters, wherein the probe has a form dictated by the first plurality of parameters as described below.

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	wherein the probe has a form dictated by the first plurality of parameters; and	Specifically, the Technicolor CGM4141 generates a message responsive to the received request, the message indicating the responsive information and having a particular form determined by the request. As described above, the first plurality parameters specified in the P-MAP define at least the form for the probe. The Technicolor CGM4141 generates the probe in accordance with the first and second plurality of parameters. "The purpose of the active probe measurement is to capture a known orthogonal frequency-division multiple access (OFDMA) probe symbol that has been transmitted by the CM, traversed the upstream cable plant, and received by the burst receiver in the CMTS. As with the downstream symbol capture measurement, the upstream active probe measurement provides a known signal at the input to the cable plant and a captured signal at the output of the cable plant. From this information the channel can then be fully characterized, including the complex-valued linear frequency response (amplitude and phase or group delay vs. frequency). The upstream spectral response of the plant may then be plotted. By performing a point-by-point numerical division of the complex output spectrum by the complex input spectrum, with proper averaging applied, an estimate of the upstream channel frequency response due to microreflections may be obtained. In addition, by comparing the input and output signals, nonlinear effects such as compression, laser clipping, and common path distortion (CPD) on the upstream may be modeled and estimated. Ingress and other noise under the carrier may be observed by removing the known signal and analyzing the residual error. The noise under the carrier may be compared to the noise measured during the quiet probe measurement described below. Field equipment may be developed to detect radio frequency (RF) leakage at locations around the cable plant, using the known probe signal as a matched filter for cross-correlation measurements." (ENTROPIC_COX_002919 at ENTROPIC_COX_002929-30)

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		Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.
1d	d) transmitting the probe from the first node to the second node.	The Accused D3.1 Cable Modem Products transmit the probe from the first node to the second node as described below. Specifically, the Technicolor CGM4141 transmits the message to the second node using its agent. The Technicolor CGM4141 transmits the probe via the specified channel (e.g. the determined subcarriers) and at the determined power level to the CMTS, thereby enabling the CMTS to generate the MER data and/or pre-equalization data as described above. "The purpose of the active probe measurement is to capture a known orthogonal frequency-division multiple access (OFDMA) probe symbol that has been transmitted by the CM, traversed the upstream cable plant, and received by the burst receiver in the CMTS. As with the downstream symbol capture measurement, the upstream active probe measurement provides a known signal at the input to the cable plant and a captured signal at the output of the cable plant. From this information the channel can then be fully characterized, including the complex-valued linear frequency response (amplitude and phase or group delay vs. frequency). The upstream spectral response of the plant may then be plotted. By performing a point-by-point numerical division of the complex output spectrum by the complex input spectrum, with proper averaging applied, an estimate of the upstream channel frequency response due to microreflections may be obtained. In addition, by comparing the input and output signals, nonlinear effects such as compression, laser clipping, and common path distortion (CPD) on the upstream may be modeled and estimated. Ingress and other noise under the carrier may be observed by removing the

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		known signal and analyzing the residual error. The noise under the carrier may be compared to the noise measured during the quiet probe measurement described below. Field equipment may be developed to detect radio frequency (RF) leakage at locations around the cable plant, using the known probe signal as a matched filter for cross-correlation measurements." (ENTROPIC_COX_002919 at ENTROPIC_COX_002929-30) Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.
7	The method of claim 1, wherein the probe request requests a probe that assists in diagnosing a network problem.	The probe request requests a probe that assists in diagnosing a network problem as described below. Specifically, the Technicolor CGM4141, using circuitry and/or applicable software modules located in the Technicolor CGM4141, provides remote diagnostics capabilities that provide real time, unobtrusive diagnostic and spectrum analysis capabilities related to diagnosing network problems. Upon information and belief, Cox utilizes these remote diagnostic capabilities to assist in diagnosing network problems in its PNM systems. "The purpose of the active probe measurement is to capture a known orthogonal frequency-division multiple access (OFDMA) probe symbol that has been transmitted by the CM, traversed the upstream cable plant, and received by the burst receiver in the CMTS. As with the downstream symbol capture measurement, the upstream active probe measurement provides a known signal at the input to the cable plant and a captured signal at the output of the cable plant. From this information the channel can then be fully

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		characterized, including the complex-valued linear frequency response (amplitude and phase or group delay vs. frequency). The upstream spectral response of the plant may then be plotted. By performing a point-by-point numerical division of the complex output spectrum by the complex input spectrum, with proper averaging applied, an estimate of the upstream channel frequency response due to microreflections may be obtained. In addition, by comparing the input and output signals, nonlinear effects such as compression, laser clipping, and common path distortion (CPD) on the upstream may be modeled and estimated. Ingress and other noise under the carrier may be observed by removing the known signal and analyzing the residual error. The noise under the carrier may be compared to the noise measured during the quiet probe measurement described below. Field equipment may be developed to detect radio frequency (RF) leakage at locations around the cable plant, using the known probe signal as a matched filter for cross-correlation measurements." (ENTROPIC_COX_002919 at ENTROPIC_COX_002929-30) Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.
8	The method of claim 7, wherein the probe request is generated by a network operator and uploaded to the second node.	The probe request is generated by a network operator and uploaded to the second node as described below. Specifically, a collector server operated by Cox, such as a collector associated with its PNM systems, provides the probe request to the second node.

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		"The upstream triggered spectrum analysis measurement provides a wideband spectrum analyzer function in the CMTS, which is tied in to the time-division multiple access (TDMA) timing of the upstream network. The spectrum analyzer can be triggered to examine desired upstream transmissions from specific users as well as underlying noise and interference during a quiet period." (ENTROPIC_COX_002919 at ENTROPIC_COX_002930) Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.